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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

RUTHKOSKY, MARK

ART UNIT PAPER NUMBER

1745

DATE MAILED: 09/03/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/363,578

Applicant(s)

RYU ET AL.

Examiner

Mark Ruthkosky

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 14 June 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-5 and 8 is/are pending in the application.
- 4a) Of the above claim(s) 8 is/are withdrawn from consideration.
- 5) ☐ Claim(s) 1-5 is/are allowed.
- 6) ☐ Claim(s) _____ is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☒ Claim(s) 8 are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 29 July 1999 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Summary

This office action is in response to the applicant's amendment filed 6/14/2004.

Election/Restrictions

Newly submitted claim 8 is directed to an invention that is independent or distinct from the invention originally claimed for the following reasons: The original claims are to a carbonaceous active material. Newly presented claim 8 is to a method of preparing a carbonaceous active material. The inventions are related as a process of making and product made (MPEP § 806.05(f)). The inventions are distinct because the product as claimed can be made by another and materially different process, such as providing a graphite core, providing a carbon precursor resin on the outer surface of the core, heating the mixture and allowing the materials to agglomerate.

Since applicant has received an action on the merits for the originally presented invention, this invention has been constructively elected by original presentation for prosecution on the merits. Accordingly, claim 8 withdrawn from consideration as being directed to a non-elected invention. See 37 CFR 1.142(b) and MPEP § 821.03.

Authorization to cancel the non-elected claim and allow the case was not given in a telephone interview with Mr. Joseph Lutz on 8/31/2004.

Claim Rejections - 35 U.S.C. § 102

The rejection of claims 1-6 under 35 U.S.C. 102(b) as being anticipated by Kuribayashi et al. ("Battery Characteristics with Various Carbonaceous Materials," Journal of Power Sources 54 (1995) 1-5) has been overcome by the applicant's amendment.

The rejection of claims 1-6 under 35 U.S.C. 102(e) as being anticipated by Ueda et al. (US 6,027,833) has been overcome by the applicant's amendment.

Claim Rejections - 35 USC § 103

The rejection of claims 1-6 under 35 U.S.C. 103(a) as being unpatentable over Itoh et al. (6,103,423) in view of Kuribayashi et al. ("Battery Characteristics with Various Carbonaceous Materials," Journal of Power Sources 54 (1995) 1-5) has been overcome by the applicant's amendment.

Allowable Subject Matter

Claims 1-5 are allowed.

The following is an examiner's statement of reasons for allowance:

The instant claims are to a carbonaceous active material comprising at least one crystalline, graphite core, and an amorphous, graphitizable, carbon shell coating the outside of the crystalline graphite core. Differential thermal analysis conducted on the carbonaceous active material in 10°C increments per minute starting from room temperature and proceeding to 1000°C at atmospheric pressure results in the displaying of at least two exothermic peaks

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overlapping to form shoulders. The amorphous, graphitizable, carbon shell coating is derived from an amorphous carbon precursor selected from the group consisting of pitch, coal based oil and heavy oil. Further, the active material of at least one crystalline graphite primary particle coated with amorphous carbon is agglomerated and made into a spherical shape to produce secondary, agglomerated particles.

The prior art does not teach carbonaceous active material comprising a crystalline, graphite core with an amorphous, graphitizable carbon shell coating the outside of the crystalline graphite core, wherein the amorphous, graphitizable carbon shell coating is derived from an amorphous carbon precursor selected from the group consisting of pitch, coal based oil and heavy oil; and wherein the amorphous carbon coated active material is agglomerated into a spherical shaped, secondary, agglomerated particles.

The most pertinent prior art has been presented.

For example, Kuribayashi et al. teaches a lithium secondary battery, which comprises particles with a graphite core, surrounded by an amorphous carbon shell. The particles have a graphite structural part and an amorphous type part (see page 1, lines 10-end). The shell is comprised of a coke-like carbon (page 1, col. 2, lines 10-15.) Example 1 and paragraph 1 on page 5 teaches the shell to be pitch-blended phenol resins. Coke is formed from a pitch precursor. The mixture is also a solid solution. Differential thermal analysis is a means for analyzing the carbon materials. Differential thermal analysis is not taught in the Kuribayashi et al. reference; however, the properties indicated by differential thermal analysis would be inherent. The carbonaceous material would have two, separate, inherent, exothermic peak values based on the graphite material and the non-graphite material. Kuribayashi does not teach the

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active material of at least one crystalline graphite primary particle coated with amorphous carbon to be agglomerated into spherical shaped secondary, agglomerated particles.

Ueda et al. (US 6,027,833) teaches a lithium secondary battery, which comprises particles with a graphite core, surrounded by an amorphous carbon shell. The particles have a graphite structural part and an amorphous type part (claim 1, col. 4, lines 15-35; line 64-col. 5, line 10; and col. 8, lines 5-58.) The shell is comprised of a coke-like carbon (page 1, col. 2, lines 10-15.) The shell is formed from hydrocarbons, pitch, tar, or phenol resins. The particles are added to a solution of an amorphous, graphitizable, carbon shell coating precursor and the material is carbonized at a temperature equivalent to that of the instant specification. Agglomerates are shown in figure 2. Differential thermal analysis is a means for analyzing the carbon materials. Differential thermal analysis is not taught in the reference; however, the properties indicated by differential thermal analysis would be inherent. The carbonaceous material would have two, separate, inherent, exothermic peak values based on the graphite material and the non-graphite material. The Ueda reference does not teach the active material of at least one crystalline graphite primary particle coated with amorphous carbon to be agglomerated into spherical shaped secondary, agglomerated particles.

Further, Itoh et al. (6,103,423) teaches a lithium secondary battery, which comprises particles with a graphite core, surrounded by an amorphous carbon shell. The particles have a graphite structural part and an amorphous part (see col. 2, line 35 to col. 3, line 35; col. 4, line 25-end; col. 6, lines 20-30 and claims 1-18.) The shell is comprised of hydrocarbon, phenol carbon resins, furan resins and polyamide resins. These materials are functional equivalents used to form the amorphous layer of the instant invention, as shown on page 5 of the instant

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specification. The particles are added to a solution of an amorphous, graphitizable, carbon shell coating precursor and the material is carbonized at a temperature equivalent to that of the instant specification. The reference does not teach the amorphous carbon precursor is selected from the group consisting of pitch, coal based oil or heavy oil, and in addition, it does not teach the active material of at least one crystalline graphite primary particle coated with amorphous carbon to be agglomerated into spherical shaped secondary, agglomerated particles.

For these reasons, the claims are allowed over the prior art. Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event,

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however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Examiner Correspondence

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mark Ruthkosky whose telephone number is 571-272-1291. The examiner can normally be reached on FLEX schedule (generally, Monday-Thursday from 9:00-6:30.) If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan can be reached at 571-272-1292. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Mark Ruthkosky

Primary Patent Examiner

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Mark Ruthkosky
9/1/04